

Application No. 10/022,997  
 Docket No. 2001U014.US  
 Reply to Office Action Dated May 25, 2004

### Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

#### Listing of Claims:

1. (Currently amended) A catalyst precursor composition represented by the formula:



wherein M is a metal from Groups 1 to 15 and the Lanthanide series of the Periodic Table of the Elements;

g is an integer equal to or greater than 1;

m is an integer equal to or greater than 2;

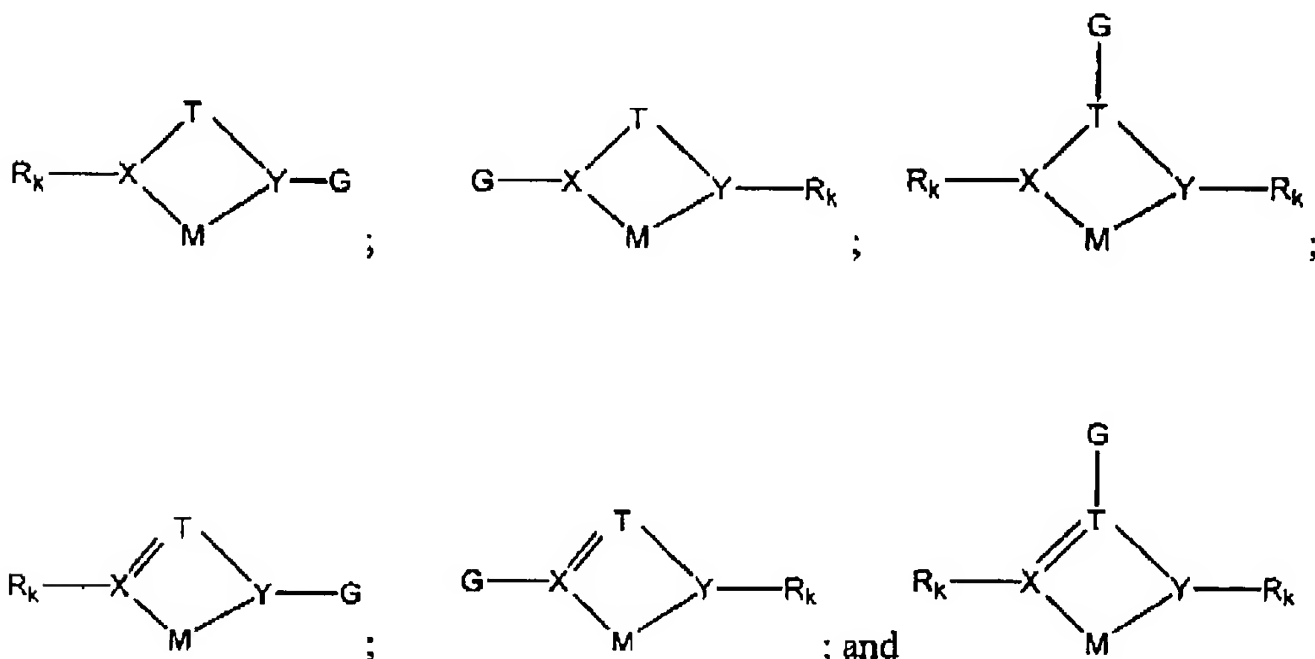
each L is a monovalent, bivalent, or trivalent anionic ligand;

p is an integer equal to or greater than 1;

n is an integer equal to or greater than 2;

G is a at least a divalent spacing group that is capable of bonding to at least two A substituents; and

at least one A is selected from the following catalytically active ligands:



Application No. 10/022,997  
Docket No. 2001U014.US  
Reply to Office Action Dated May 25, 2004

wherein G is bound to at least two A substituents;

X and Y are Group 14 or 15 atoms;

~~wherein~~ T is a bridging group containing 2 or more bridging atoms;

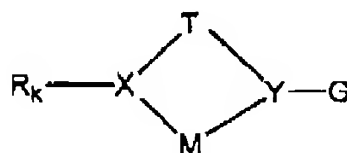
R is selected from bulky and non-bulky substituents with respect to X, Y, or both X and Y, and

k is an integer that will vary to satisfy the oxidation state of but will range from about 1 to 3.

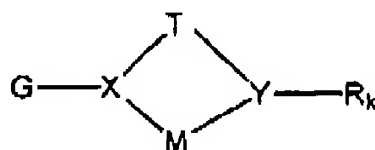
2. (Original) The catalyst precursor composition of claim 1 wherein each L is independently a monovalent, bivalent, or trivalent anionic ligand containing from about 1 to 50 non-hydrogen atoms, and is independently selected from the group consisting of halogen containing groups; hydrogen; alkyl; aryl; alkenyl; alkylaryl; arylalkyl; hydrocarboxy; amides, phosphides; sulfides; silyalkyls; diketones; borohydrides; and carboxylates.
3. (Original) The catalyst precursor composition of claim 2 wherein each L is independently selected from alkyl, arylalkyl, and halogen containing groups and contains from about 1 to 20 non-hydrogen atoms.
4. (Original) The catalyst precursor composition of claim 1 wherein G is selected from alkyl, alkenyl, cycloalkyl, heterocyclic (both heteroalkyl and heteroaryl), alkylaryl, arylalkyl.
5. (Original) The catalyst precursor composition of claim 4 wherein G contains from about 1 to 20 non-hydrogen atoms.
6. (Original) The catalyst precursor composition of claim 1 wherein G contains from about 1 to 50 non-hydrogen atoms.

Application No. 10/022,997  
Docket No. 2001U014.US  
Reply to Office Action Dated May 25, 2004

7. (Original) The catalyst precursor composition of claim 1 wherein R is a non-bulky substituent that has relatively low steric hindrance with respect to X or Y and is selected from the group consisting of straight and branched chain alkyl groups.
8. (Original) The catalyst precursor composition of claim 7 wherein R is a C<sub>1</sub> to C<sub>30</sub> alkyl group.
9. (Original) The catalyst precursor composition of claim 8 wherein R is a C<sub>1</sub> to C<sub>20</sub> alkyl group.
10. (Currently amended) The catalyst precursor composition of claim 1 wherein R is a bulky substituent with respect to X or Y and is selected from alkyl, alkenyl, cycloalkyl, heterocyclic, alkylaryl, and arylalkyl, ~~polymeric, and inorganic ring structures.~~
11. (Original) The catalyst precursor composition of claim 10 wherein R is a bulky substituent and contains 3 to 30 non-hydrogen atoms.
12. (Original) The catalyst precursor composition of claim 1 wherein M is selected from Groups 3 to 7 of the Periodic Table of the Elements.
13. (Original) The catalyst precursor composition of claim 1 wherein A is represented by:



14. (Original) The catalyst precursor of claim 1 wherein A is represented by:



Application No. 10/022,997

Docket No. 2001U014.US

Reply to Office Action Dated May 25, 2004

15. (Currently amended) A catalyst composition comprising:

a) a catalyst precursor composition represented by the formula:



wherein M is a metal from Groups 1 to 15 and the Lanthanide series of the Periodic Table of the Elements;

g is an integer equal to or greater than 1;

m is an integer equal to or greater than 2;

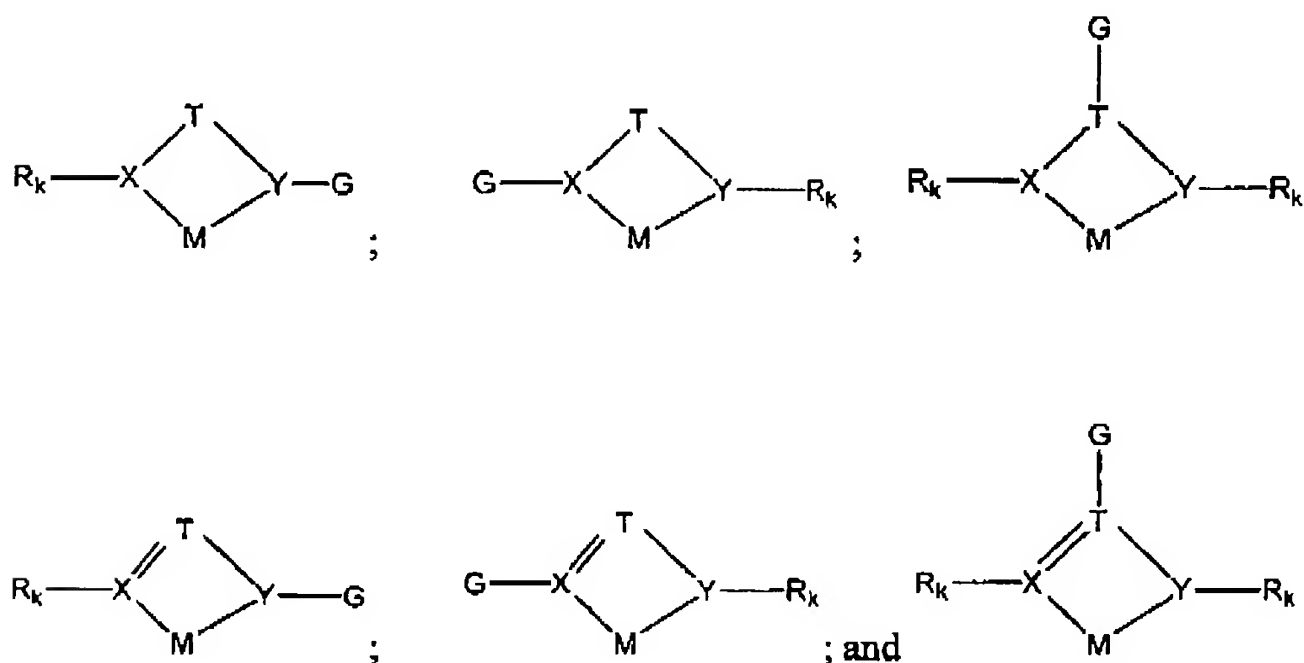
each L is a monovalent, bivalent, or trivalent anionic ligand;

p is an integer equal to or greater than 1;

n is an integer equal to or greater than 2;

G is a at least a divalent spacing group ~~that is capable of bonding to at least two A~~ substituents; and

~~at least one A~~ is selected from the following catalytically active ligands:



wherein G is bound to at least two A substituents;

X and Y are Group 14 or 15 atoms;

~~wherein~~ T is a bridging group containing 2 or more bridging atoms;

Application No. 10/022,997

Docket No. 2001U014.US

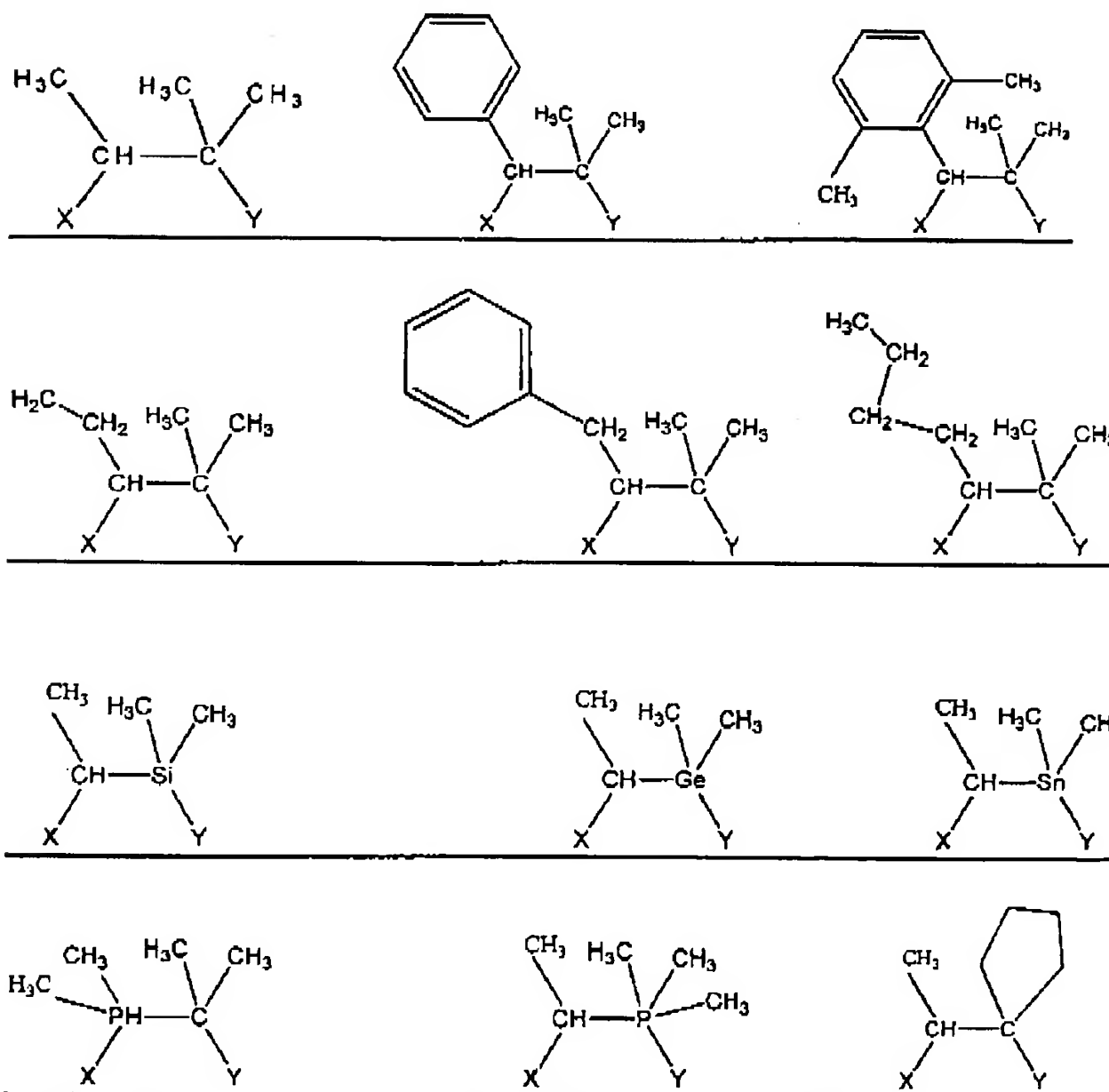
Reply to Office Action Dated May 25, 2004

R is selected from bulky and non-bulky substituents with respect to X, Y, or both X and Y; and

k is an integer that will vary to satisfy the oxidation state of but will range from about 1 to 3;

b) and an activator.

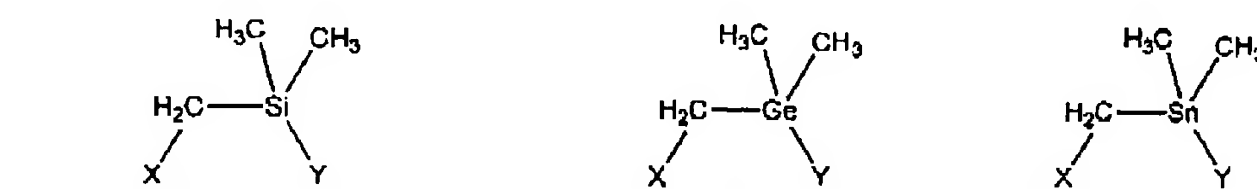
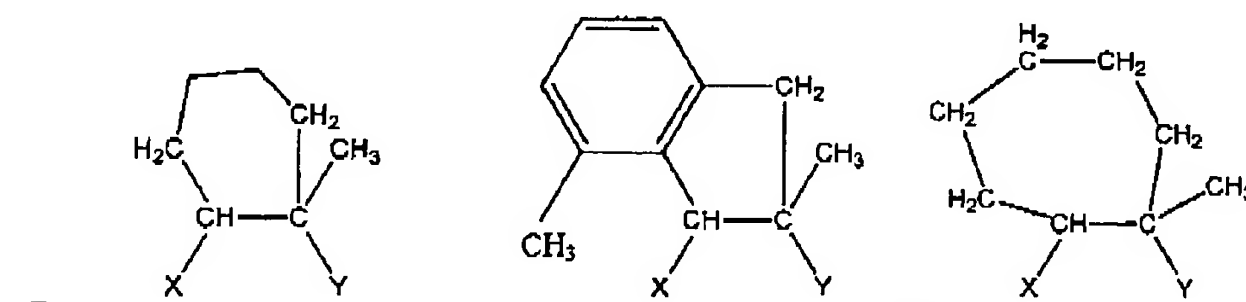
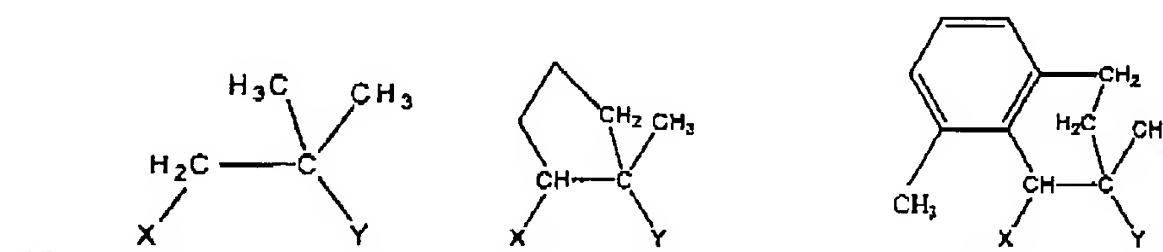
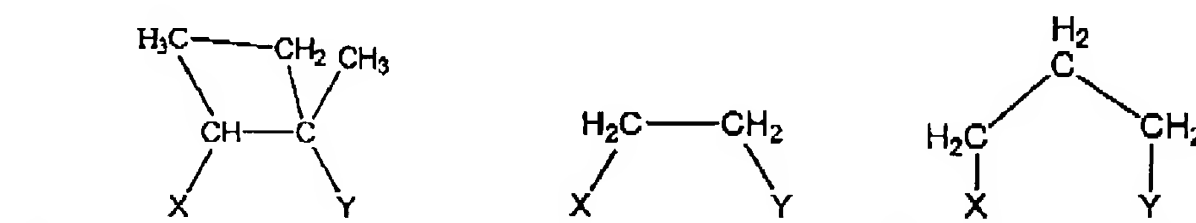
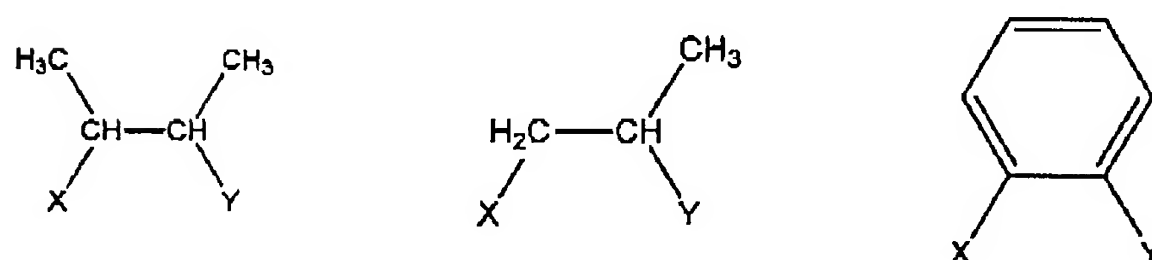
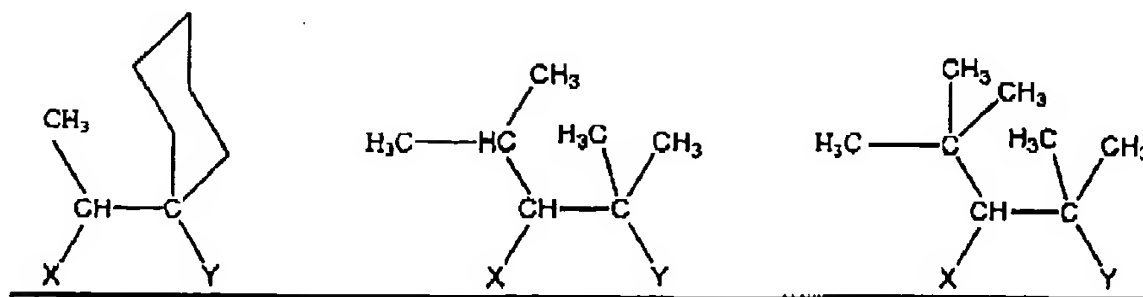
16. (Currently amended) The catalyst composition of claim 15 wherein T is selected from:



Application No. 10/022,997

Docket No. 2001U014.US

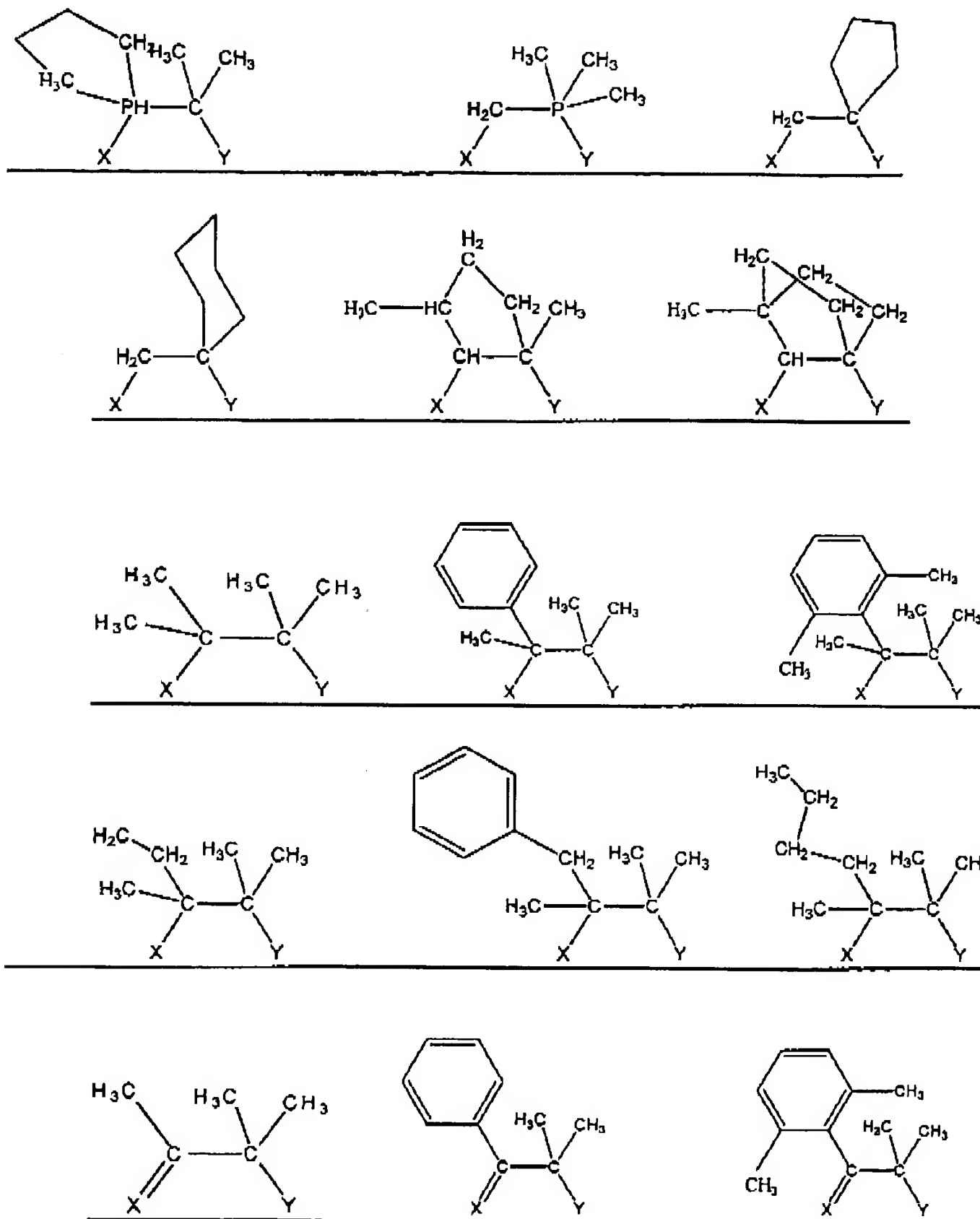
Reply to Office Action Dated May 25, 2004



Application No. 10/022,997

Docket No. 2001U014.US

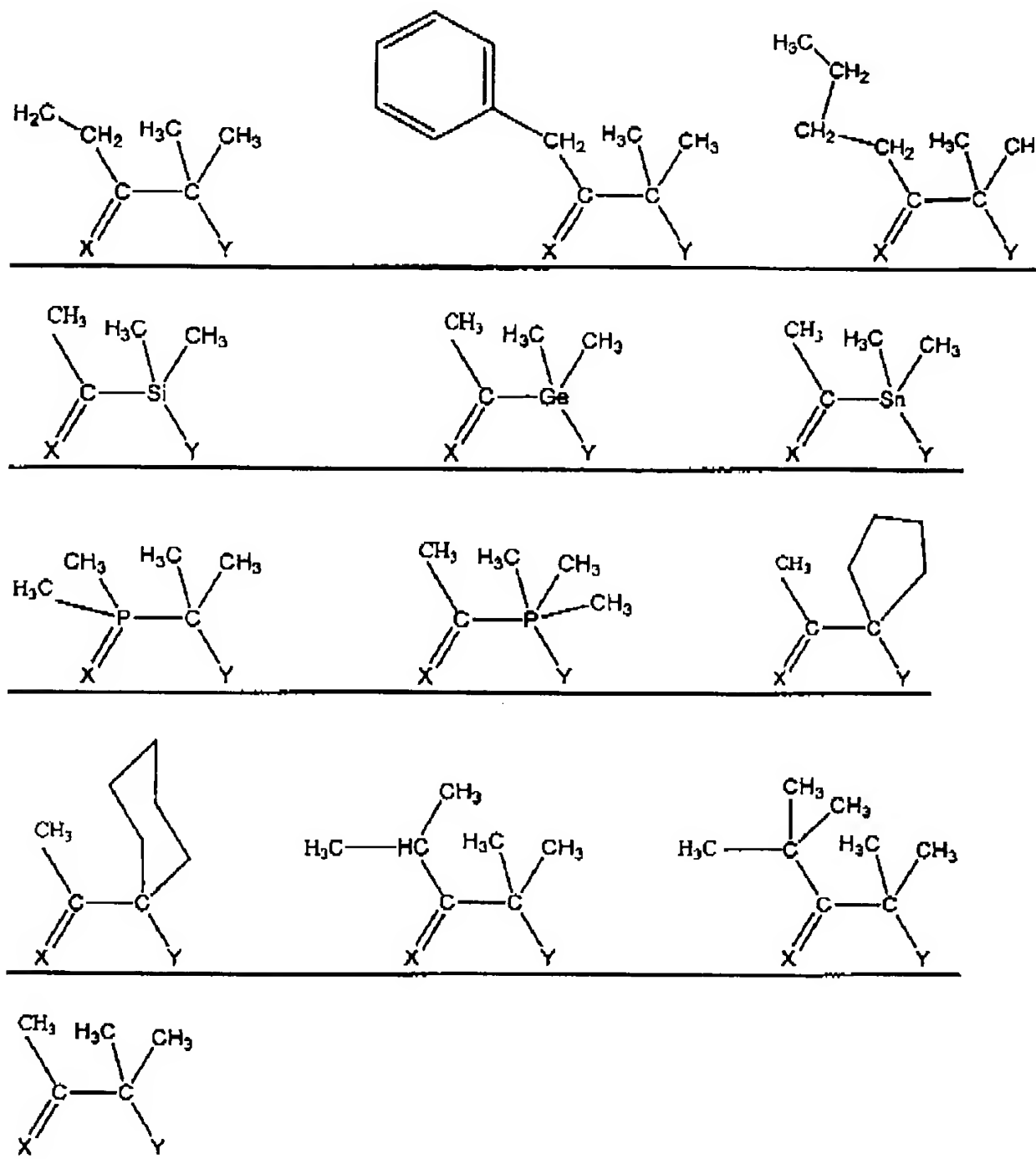
Reply to Office Action Dated May 25, 2004



Application No. 10/022,997

Docket No. 2001U014.US

Reply to Office Action Dated May 25, 2004



wherein the X and Y substituents are included for convenience.

17. (Original) The catalyst composition of claim 15 wherein each L is independently a monovalent, bivalent, or trivalent anionic ligand containing from about 1 to 50 non-hydrogen atoms, and is independently selected from the group consisting of halogen containing groups; hydrogen; alkyl; aryl; alkenyl; alkylaryl; arylalkyl; hydrocarboxy; amides, phosphides; sulfides; silyalkyls; diketones; borohydrides; and carboxylates.

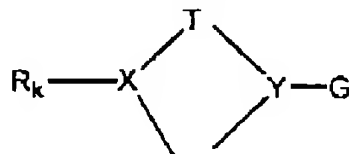


Application No. 10/022,997  
Docket No. 2001U014.US  
Reply to Office Action Dated May 25, 2004

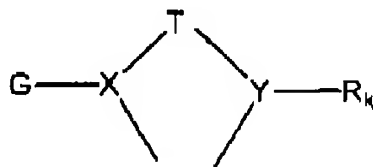
18. (Original) The catalyst composition of claim 17 wherein each L is independently selected from alkyl, arylalkyl, and halogen containing groups and contains from about 1 to 20 non-hydrogen atoms.
19. (Currently amended) The catalyst composition of claim 15 wherein G is selected from alkyl, alkenyl, cycloalkyl, heterocyclic (~~both heteroalkyl and heteroaryl~~), alkylaryl, arylalkyl and heteroalkyl.
20. (Original) The catalyst composition of claim 19 wherein G contains from about 1 to 50 non-hydrogen atoms.
21. (Original) The catalyst composition of claim 15 wherein R is a non-bulky substituent that has relatively low steric hindrance with respect to X or Y and is selected from the group consisting of straight and branched chain alkyl groups.
22. (Original) The catalyst composition of claim 21 wherein R is a C<sub>1</sub> to C<sub>30</sub> alkyl group.
23. (Original) The catalyst composition of claim 22 wherein R is a C<sub>1</sub> to C<sub>20</sub> alkyl group.
24. (Currently amended) The catalyst composition of claim 15 wherein R is a bulky substituent with respect to X or Y and is selected from alkyl, alkenyl, cycloalkyl, heterocyclic, alkylaryl, and arylalkyl, ~~polymeric, and inorganic ring structures~~.
25. (Original) The catalyst composition of claim 24 wherein R is a bulky substituent and contains 3 to 30 non-hydrogen atoms.
26. (Original) The catalyst composition of claim 15 wherein M is selected from Groups 3 to 7 of the Periodic Table of the Elements.

Application No. 10/022,997  
Docket No. 2001U014.US  
Reply to Office Action Dated May 25, 2004

27. The catalyst composition of claim 15 wherein A is represented by:



28. The catalyst composition of claim 16 wherein A is represented by:



29. (New) The catalyst precursor composition of Claim 1, wherein X and Y are selected from nitrogen, sulfur and phosphorous.
30. (New) The catalyst composition of Claim 15, wherein X and Y are selected from nitrogen, sulfur and phosphorous.